

HP Performance Optimized Datacenter 40c G2 Site Preparation and Requirements Guide

Abstract

This document provides site preparation guidance for the HP Performance Optimized Datacenter 40c G2 (HP POD 40c G2).



Part Number: 695162-002
August 2012
Edition: 2

© Copyright 2012 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Contents

Overview	5
About this document	5
Safety and NEC compliance	5
Site assessment	6
Site preparation	6
Site safety and security	6
Fire detection and suppression	6
HP POD 40c G2 capacities	7
HP POD 40c G2 capacity limitations	7
Electrical power capacities (critical IT power)	7
Mechanical cooling capacities	7
Overall system capacities	7
Site requirements	8
Site pad	8
HP POD 40c G2 weight	8
Dimensions and clearances	8
Safety and clearance area	10
Future expansions	11
Grounding requirements	11
Utilities	12
Humidifier water supply	12
Drainage	13
Chilled water supply	13
Piping materials	15
Power infrastructure installation	15
Site electrical system	15
Electrical power system configuration	15
Transformers and switchboards	16
Supported facility connections	17
Environmental control system	17
Additional POD connections	17
Connection portals	17
Demarcation box	18
Fire box	19
Humidifier	20
HP POD 40c G2 security	20
Fire, safety, and security notifications	20
Environmental considerations	22
Environmental risks	22
Cold weather	22
Areas prone to lightning or power surges	22
Seismic activity	22
Site plan requirements and actions	23

Completing a site assessment	23
HP Site Preparation Drawing Package	23
Zoning and permit requirements	23
Project coordination	23
Site planning	24
HP POD 40c G2 installation	24
Appendix A: HP site assessment	27
HP POD 40c G2 site assessment checklist	27
Appendix B: Preparing for delivery	31
Pre-delivery tasks	31
Installation prerequisites	31
HP POD 40c G2 site readiness checklist	31
Appendix C: Regulatory compliance notices	35
HP POD 40c G2 regulatory compliance	35
Regulatory compliance identification numbers	35
Federal Communications Commission notice	35
Modifications	35
Cables	36
Canadian notice (Avis Canadien)	36
Glossary	37
Documentation feedback	39
Index	40

Overview

About this document

This document outlines the site preparation requirements for an HP Performance Optimized Datacenter 40c G2. The customer must provide a qualified architectural or consulting engineering team to generate site-specific documents for each HP POD 40c G2 installation, including final site drawings. The customer's site installation design must comply with all local and national regulations, ordinances, codes, and the specifications listed in this document.

Safety and NEC compliance

The HP POD 40c G2 is certified to UL 69050-1/IEC 60950-22 as a Modular Data Center Information Technology Product and classified according to the National Electric Code NFPA 70 in accordance with NEC (NA) and IEC (EMEA and APJ). Relevant parts of UL 1995 are applied to the air handling features of the product. For more information, see "HP POD 40c G2 regulatory compliance (on page 35)."

The HP POD 40c G2 is not suitable for long-term human occupancy. The HP POD 40c G2 has service access areas for periodic maintenance and service. These areas must be used only by owner-authorized personnel who are trained in the maintenance and service of the HP POD 40c G2 components.



IMPORTANT: Before installing the HP POD 40c G2, consult your local AHJ for applicable codes and to review site-specific location guidelines. If needed, obtain any necessary permits.

Additional considerations for safety and NEC compliance are as follows:

- The HP POD 40c G2 is listed as an Information Technology Equipment Product to UL 60950.
- The HP POD 40c G2 is evaluated as a "non-inhabitable product" that provides "service access" areas for customer-authorized, qualified, and trained service personnel.
- The electrical connections of the HP POD 40c G2 are evaluated as feeder connections for connection to an existing facility, and are not suitable as "service entrance" for connection to the utility.
- The HP POD 40c G2 is designed for stationary installation outdoors in a Pollution Degree 3 environment, in restricted access locations, with field wiring terminals provided for permanent supply connections.
- The HP POD 40c G2 meets the following ratings:

Feature	Specification
Category	Rated Overvoltage Category III
Protection	Surge protection device
Class	Class I
Ambient temperature	2°C to 54°C (35.6°F to 129.2°F)
Relative humidity	0% to 100% humidity

- As part of the overall certification, relevant sections of the International Building Code have been applied as part of the design and evaluation. The current design supports wind loads up to 90 mph.

Site assessment

HP requires a detailed site assessment prior to planning and preparing the customer site location for the HP POD 40c G2. Consult with HP to schedule a site assessment.

Site preparation

Site preparation must be complete prior to the POD delivery to ensure a timely installation and commissioning. The site must meet all pad, power, and chilled water requirements.

Site safety and security

Each customer site must have its own standard safety and security requirements. The HP Program Managers work with the customer to ensure adherence to the appropriate precautions. HP is not responsible for determining or enforcing safety or security requirements. The customer must conduct all health and safety evaluations of the HP POD 40c G2, only using HP as a support mechanism.

Fire detection and suppression

The fire suppression system, supplied as an optional component of the HP POD 40c G2, is a "Manufacturer Designed" system specifically for this HP product, in compliance with national standards.

The HP standard suppression system includes a Novec 1230 clean agent system. However, if the customer or local AHJ requires specific modifications or a replacement, HP can assist in these actions at the expense of the customer.

HP does not certify that the fire suppression system installed in the HP POD 40c G2 meets all local and jurisdictional requirements. The customer is responsible for the following actions as related to the fire suppression system:

- Verifying that the POD suppression system meets local codes, including specific local requirements for initial and periodic inspections.
- Arranging for and receiving all required local permits, including initial commissioning as well as standard and repair maintenance.
- Arranging for the connection of the agent tanks, refilling of tanks, and all system testing, including pressure tests. All general maintenance of the suppression system must be completed by an authorized technician.

Additional local requirements are not covered as part of the option price or basic installation and deployment services, unless specifically included in an executed Statement of Work.

HP POD 40c G2 capacities

HP POD 40c G2 capacity limitations

The capacity limitations for the HP POD 40c G2 are separated into two categories: electrical power and mechanical cooling capacities. Both of these categories are interdependent and must be considered in conjunction with the overall customer requirements.

Electrical power capacities (critical IT power)

The electrical system of the HP POD 40c G2 has two main feeds, A and B, each rated at 800 A 415 VAC Wye 3-Phase.

Mechanical cooling capacities

The HP POD 40c G2 cooling system consists of 6 zones. Each zone includes 2 heat exchangers and 18 fans. Cooling capacities are based on:

- Chilled water inlet temperature of 15.6°C (60°F)
- Heat exchanger fluid delta temperature of 5.5°C (10°F)
- Pure water cooling
- Chilled water flow rate of 908 lpm (240 gpm)
- Average air flow of 2000 cfm per rack

Overall system capacities

The HP POD 40c G2 overall system capacities are provided in the following table. It is the customer's responsibility to understand the level of redundancy required for their particular application and its associated limiting factor.

Redundancy level	Electrical (kW)	Thermal (kW)	Limiting factor
N	—	600	Thermal*
N+1	—	400	Thermal*
2N	576	300	Thermal*

*The thermal limitation factors are described in "Mechanical cooling capacities (on page 7)."

Site requirements

Site pad

The structural design of the HP POD 40c G2 site pad must be based on the specific weight load of the complete POD solution with IT installed, as well as any additional equipment. During design calculations, HP recommends that you provide structural support along the entire perimeter of the POD and use the maximum allowable POD weight.

Upon installation, the POD structure must be leveled to $\leq 0.5^\circ$. Shimming is allowed around the perimeter of the POD to ensure that the POD remains level.



IMPORTANT: The HP POD 40c G2 is designed for ground level installation. If you install the HP POD 40c G2 on an elevated surface, verify that the minimum height requirements for circuit breaker actuators are considered per local and national requirements and electrical codes. The area in front of the outside panels must include a work platform.

HP POD 40c G2 weight



IMPORTANT: The weight provided is a minimum and an absolute maximum rated weight. The total weight of the HP POD 40c G2 differs based on the IT equipment and optional components purchased and installed.

The overall weight might significantly vary depending on the final customer-chosen solution for the HP POD 40c G2. Each site pad must meet the weight requirements of the equipment that is expected to be installed.

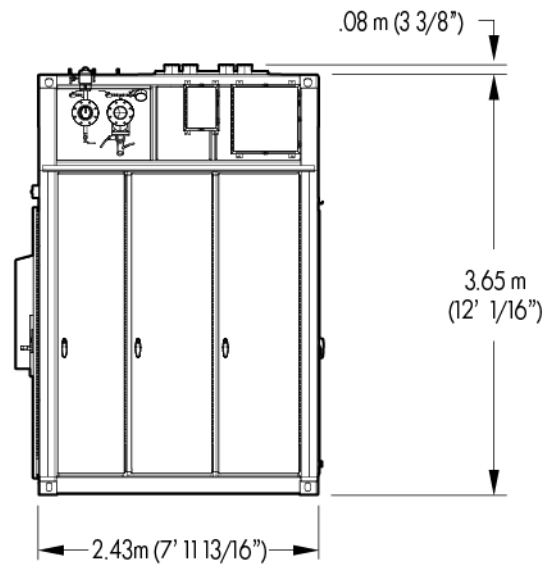
The HP POD 40c G2 must be installed on a surface capable of supporting the following weights:

- HP POD 40c G2 without IT equipment installed—Approximately 16,783 kg (37,000 lb)
- HP POD 40c G2 with IT equipment installed—Maximum 46,266 kg (102,000 lb)

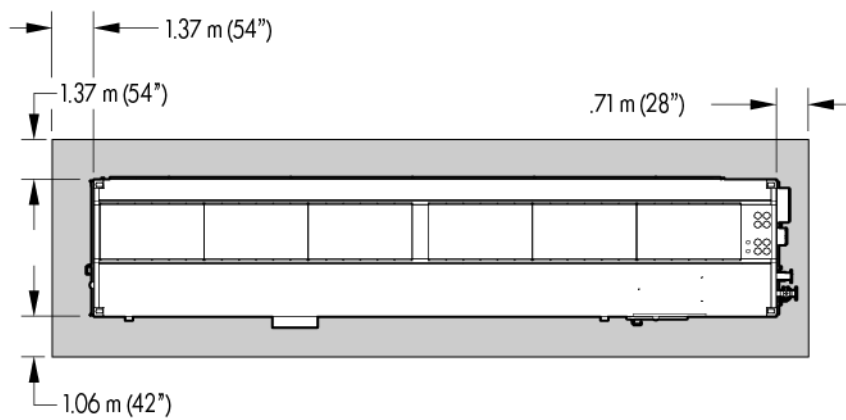
Dimensions and clearances

The selected site for the HP POD 40c G2 must be large enough to install, service, maintain, and have space for potential growth or expansion with additional PODs.

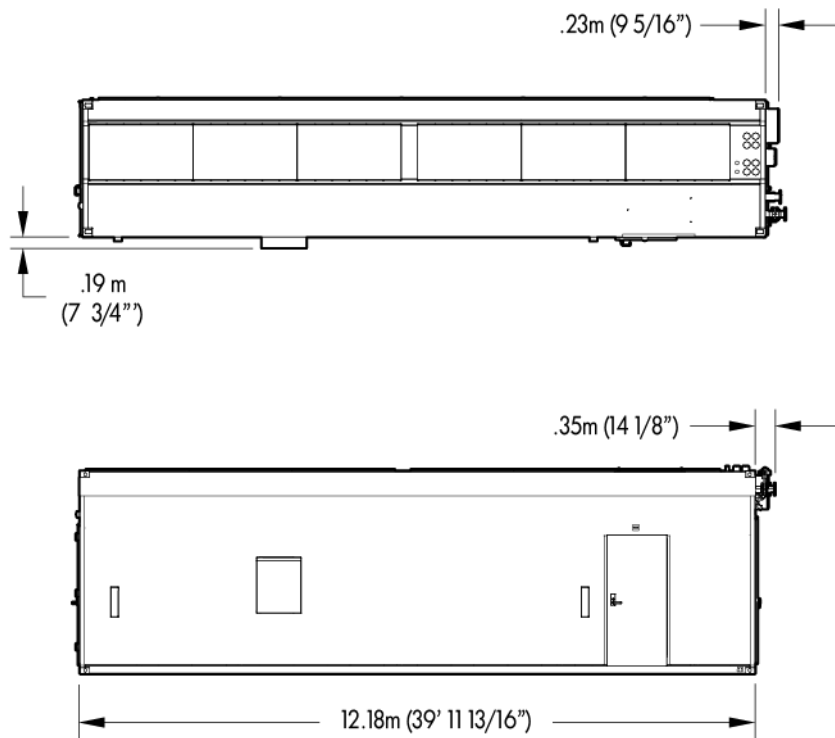
End 1 view clearances shown



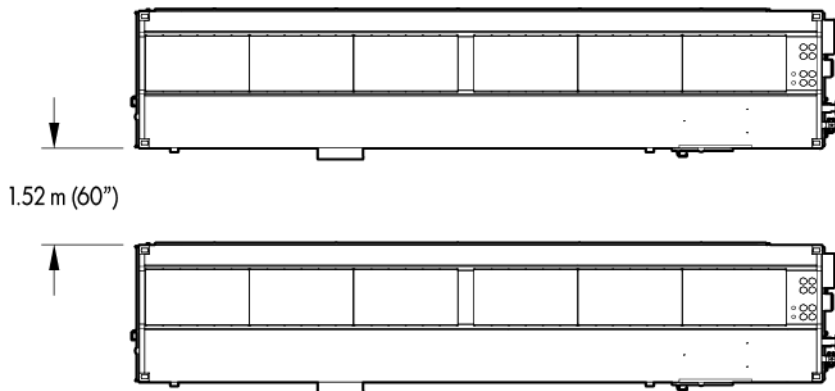
Top view keep-out clearances shown (shaded areas indicate required clearances)



Top view clearances shown



Side view clearances shown



Adequate space around the HP POD 40c G2 is necessary for airflow and cooling purposes.

These minimum clearances provide room for door opening only. Consider additional space as necessary for your site.

Safety and clearance area



WARNING: Check for electrical distribution and transmission lines in, over, and under the construction site and maintain a safe working clearance from energized electrical lines. Consult your local utility company or AHJ for required clearances.

Verify the following clearances prior to delivery:

- Working distance clearance—Maintain a safe working clearance according to the local utility company or AHJ for each of the following items:
 - Buildings
 - Fences
 - Gate headers
 - Underground and overhead utilities
- Infrastructure clearance
 - Underground power conduits, excluding power, water, and drainage lines connected to the HP POD 40c G2
 - Underground water lines, excluding power, water, and drainage lines connected to the HP POD 40c G2
 - Underground sewage lines, excluding power, water, and drainage lines connected to the HP POD 40c G2
- Traffic clearance

For more information, see the local and national requirements, and site safety requirements.

Future expansions

When selecting a site location, consider future space and accessibility requirements. Adequate space around the HP POD 40c G2 is necessary for locating additional equipment within close proximity, such as generators and UPS devices. When installing additional equipment within close proximity to the HP POD 40c G2, consult with HP for site locations.

For specific space requirements, see "Dimensions and clearances (on page 8)."

Grounding requirements

The HP POD 40c G2 structure and internal components are all bonded together. A common grounding electrode conductor connection point is provided on the utility-end cold aisle.



WARNING: To avoid the risk of personal injury or electric shock, the HP POD 40c G2 must be properly grounded (earthed) in accordance with local and national requirements.

The following is a list of component requirements for grounding and bonding:

- Grounding of the HP POD 40c G2 must comply with the requirements of Article 250 of the NEC, NFPA 70-2011 (NA/JPN) and with local and regional regulations (IEC for EMEA and APJ).
- Bonding of the piping systems and any exposed structural steel, installed to support the HP POD 40c G2, must be in accordance with NEC (NA) and with local and regional regulations (IEC for EMEA and APJ).

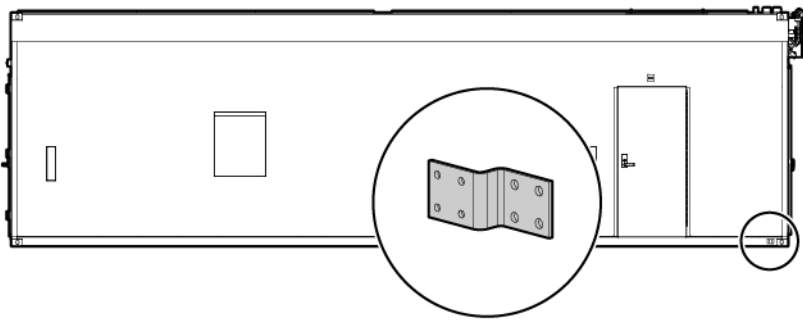
Grounding feature	Specification
Grounding electrode conductor pad	- The grounding electrode conductor connection bus pad is located on the outside of the HP POD 40c G2 on the cold aisle adjacent to the power cabinet. - The grounding pad must be connected to the grounding electrode system or building steel in accordance with Article 250 of the NEC or equivalent regional regulation.
Grounding lugs	- Grounding lugs cannot be attached to any painted surface. - Grounding lugs must be compression-type 2-hole lugs and UL listed specifically for grounding.
Ground rod system or ground well	The customer must provide an effective grounding system with a ground rod or a ground well.



IMPORTANT: Before installing the HP POD 40c G2, consult your local AHJ for applicable codes and to review site-specific location guidelines. If needed, obtain any necessary permits.

The following figure shows the grounding electrode conductor connection that is located on the cold aisle of the HP POD 40c G2.

Side view shown



Utilities

Consider the proximity to required utilities, such as power, water, and network connections. While the required utilities can be brought to nearly any selected site, there is the potential for increased costs and decreased efficiency when the HP POD 40c G2 is located farther from the utility sources.

For utility clearance information, see "Dimensions and clearances (on page 8)."

Humidifier water supply

The HP POD 40c G2 requires supply water for the humidifier. The supply water must meet the following requirements.

Requirement	Specification
Pressure	Between 20 and 110 psi, 0.1 and 0.8 MPa
Temperature	Between 1° and 40°C (33° and 104°F)
Minimum flow rate	1.45 lpm (0.12 gpm)

Requirement	Specification
Connection	1.9 cm (.75 in) G Adapter to 1.9 cm (.75 in) FPS
Hardness	No greater than 40°FH (equal to 400 ppm of CaCO ₃)
Conductivity	100 to 1250 µS/cm
Organic compounds	None
Type of water	Drinking water. Do not use de-mineralized or softened water.
Instant water fill flow rate	0.6 lpm (0.16 gpm)
Humidifier	For the exact requirements, see the humidifier documentation.



IMPORTANT: If your water is out of range, consult a water quality expert.



IMPORTANT: You must provide a humidification water supply isolation valve that is external to the HP POD 40c G2.

In addition to the previous requirements, observe the following requirements and recommendations:

- Do not treat the water with softeners. Softeners can produce foam, which affects the operation of the unit.
- Do not use well water, industrial water, water from cooling circuits, or water contaminated by any chemicals or bacteria.
- Do not add potential irritants to the water, such as disinfectants or anti-corrosive compounds.
- The manufacturer recommends installing an in-line filter for the water supply. It is your responsibility to determine if a filter should be installed, and if so, its location. The filter cannot be installed inside the HP POD 40c G2 and must be compatible with the type of humidifier that is installed.

For more information, see the *HP Performance Optimized Datacenter 40c G2 Maintenance and Service Guide*.

Drainage

Requirement	Location	Specification
Condensate drains	Hot aisle side (2)	3.18 cm (1.25 in) drain line and 26.5 lpm (7 gpm) max
Humidifier drains	Cold aisle side (1)	3.18 cm (1.25 in) drain line and 26.5 lpm (7 gpm) max

Chilled water supply

The following are the water quality requirements and specifications:

- Closed-loop water must not contain any lime scale deposits or loose debris.
- The temperature of the chilled water supplied to the HP POD 40c G2 must be 12°C to 24°C (55°F to 75°F).



CAUTION: Freezing water can cause a blockage and damage to the unit. In outside locations that are subject to freezing temperatures, an additive such as glycol might be necessary to lower the freezing point. However, since the heat transfer potential of water with glycol is lower, the HP POD 40c G2 must be de-rated accordingly.



IMPORTANT: The chilled water system piping and heat exchangers must be drained completely, and then purged using compressed air when storing or transporting at or below freezing temperatures.



IMPORTANT: Operating the chilled water system at the higher end of the acceptable range decreases the overall thermal capacity of the POD.

Acceptable water quality specifications

Water must be maintained per the following acceptable water quality standards.

Parameter	Range
pH	8.0–10
Specific conductance at 25°C (77°F)	10–2500 μ mhos
Alkalinity ("M" as CaCO ₃)	150–1000 ppm
Sulfur (SO ₄)	0–150 ppm
Chloride (Cl)	0–100 ppm
Hardness (CaCO ₃)	0–350 ppm
Calcium hardness (CaCO ₃)	0–200 ppm
Magnesium hardness (CaCO ₃)	0–150 ppm
Copper (Cu)	< 0.20 ppm
Iron (Fe)	< 3.0 ppm
Aluminum (Al)	< 0.50 ppm
Sodium (Na)	0–1000 ppm
Silica (SiO ₂)	0–150 ppm
Zinc (Zn)	< 1.0 ppm
Manganese (Mn)	< 0.1 ppm
Phosphate Ortho- (PO ₄)	< 3 ppm
Bacteria	< 1000 CFU/ml
Suspended solids	< 10 ppm

If your water is out of range, consult a water quality expert.

The following table describes the chilled water system specifications for the HP POD 40c G2.

Feature	Specification
Facility input temperature to the HP POD 40c G2	12°C to 24°C (55°F to 75°F)
Working pressure	1,034 kPa (150 psi)
HP POD 40c G2 pressure drop	172.4 kPa (25 psi)
HP POD 40c G2 water flow rate	908.5 lpm (240 gpm)
Chilled water supply and return connections	- North America—Two 10.16 cm (4 in) ASME B16.5 class #150 flanges - International—Two DIN PN16 DN100 flanges

Piping materials

Do not use the following interconnecting piping materials in a closed water system:

- Oxidizing biocides
- Aluminum components
- Brass components with high levels of zinc
- Non-stainless steel iron components
- PVC



IMPORTANT: Even though some PVC grade piping materials are designed to handle the expected water pressure, the use of PVC materials should be reviewed and approved by the customer site engineers.

Power infrastructure installation

When determining the final location of the power connections, consider the following:

- Distance between the facility utilities and the location of the transformer and switchboard
- Distance between the transformer and switchboard and the HP POD 40c G2
- Distance between the UPS/Generator locations and the HP POD 40c G2 switchboard
- Requirements for routing electrical feeders (underground or overhead)

The facility power connection must be installed in compliance with local electrical codes and regulations. HP reference electrical installation design is based on a maximum distance of 15.2 m (50 ft) or line of sight between the switchboard and the HP POD 40c G2.

Site electrical system

To ensure a complete and safe integration of the HP POD solution with your facility, HP requires that you complete the following actions for the installed electrical system prior to the installation of the HP POD solution:

- Short circuit analysis
- Arc flash study
- Circuit breaker coordination study

These actions must be performed for all associated parts of the electrical power train. The majority of the details and factors required to complete these studies are associated with the existing installed facility infrastructure.



CAUTION: Failure to complete these studies can cause serious issues with the electrical integration of the POD into your electrical system.

Electrical power system configuration

A preliminary meeting with the HP POD Electrical Engineering team is necessary to discuss your decision concerning capacity limitations and the impacts of this decision on the electrical design.

A 1N electrical configuration can be achieved by providing all required electrical feeders from a common power source and from common switchboards, and transformers.

A 2N electrical configuration can be achieved by feeding parallel power paths from independent power sources, switchboards, and transformers.



IMPORTANT: The required neutral must be provided as part of the 800 A 415VAC Y direct connection to the HP POD 40c G2.



IMPORTANT: All 3-Phase Wye feeders for the HP POD 40c G2 require that the neutrals and the equipment grounding conductors remain isolated. Bonding of the two conductors is allowed at the power source only.

Transformers and switchboards

The input power for the critical IT loads requires a source of 380-415V, 3-Phase Wye power. To achieve this input power, a custom transformer might be required if it does not already exist at the source. In addition to the overall loading and KVA size, you must consider the Harmonic Content of the installation when specifying the K-Factor of the transformer. Alternatively, you can use Harmonic Mitigating Transformers to passively cancel the harmonics generated by the IT Equipment.

HP offers several power solutions that include automatic transfer switching, UPS backup, transformers and output distribution switchboards to supply your power needs.

On-site connections might include:

- Main facility power to the primary side of the transformer
- Transformer to the switchboard

For connection information, see the *HP Site Preparation Drawing Package* (on page [23](#)).

Supported facility connections

Environmental control system

The ECS developed for the HP water-cooled POD is a stand-alone control system that requires no external connections with an external site system, BMS, public or private Internet sites, cloud, or wireless system to properly control the POD operation.

The ECS includes Modbus TCP/IP connections through which a variety of data can be retrieved. These capabilities enable you to connect, at your expense, with the stand-alone ECS system to monitor the operating parameters of the POD. It is your responsibility (or your representative's or agent's responsibility) to integrate this communication capability into any existing BMS or monitoring system.



CAUTION: To ensure that alarm conditions can be identified and resolved, HP recommends that you remotely monitor all alarm conditions. Failure to monitor the alarm conditions can cause delays in appropriate action during an alarm condition.

Additional POD connections

The HP POD 40c G2 provides various connection points to your facility. It is your responsibility to facilitate these connections. HP can make these connections when specifically contracted to deliver these services and a Scope of Work has been drafted, reviewed, and signed for delivery services. Available POD connections include the following:

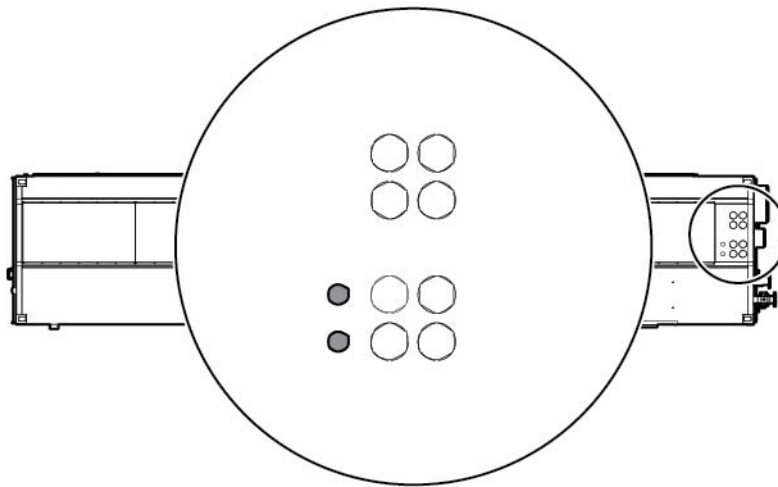
- Life safety systems
 - EPO
 - Fire detection
 - Fire suppression
- Site communication
 - Phone
 - Security
- Networking—IT connections

Connection portals

There are networking and connection portals located on the top of the utility-end of the HP POD 40c G2. These portals are provided to allow the customer to make connections to the HP POD 40c G2.

Each HP POD 40c G2 has 10 portals, which are shown in the following figure and described in the following table. The connection portal location and configuration might vary, depending on the HP POD 40c G2 model.

Top view shown



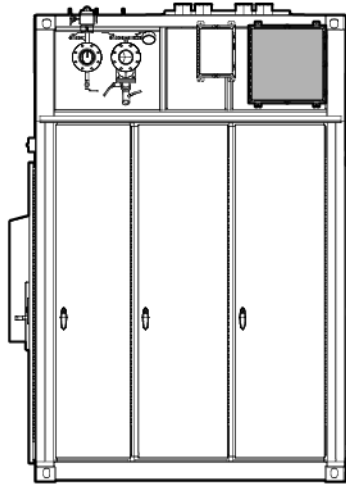
Connection portal diameter	Connection point	Quantity
10.16 cm (4 in) portal	Main electrical power feeds	8
5.08 cm (2 in) portal	Communication connection for all communication • ECS • EPO • Fire alarm • Telephone	2

Demarcation box

The following communication connections between the customer facility and the HP POD 40c G2 are made through the demarcation box:

- ECS communication
- Security communication
- Telephone

End view shown

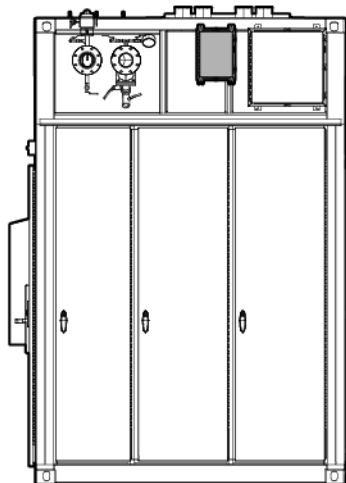


You must make the connections between the facility and the HP POD 40c G2. For configuration and installation instructions, consult with HP.

Fire box

The communication connections between the fire system and the HP POD 40c G2 are made through the fire box.

End view shown



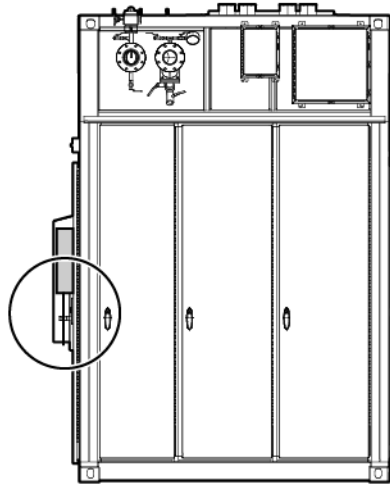
You must make the connections between the facility and the HP POD 40c G2. For configuration and installation instructions, consult with HP.

Humidifier

A dedicated water supply and approved drainage is required for the humidifier. For more information about the humidifier, see the *HP Performance Optimized Datacenter 40c G2 Operation and Maintenance Manual* provided with the HP POD 40c G2.

The following image shows the location of the humidifier drain and water supply.

End view shown



IMPORTANT: Confirm with the AHJ that condensate water and rain water can be mixed in the same drainage.

HP POD 40c G2 security

The HP POD 40c G2 is equipped with standard key lock hardware for each personnel entry door and external electrical cabinet. Each personnel entry door includes a door access contact that can be connected to the customer facility security system.

Additional options for controlled access security include the following:

- Electronic card reader
- 12-digit security code keypad
- Magnetic lock on each personnel entry door and dynamic hot aisle door

Fire, safety, and security notifications

Dry contacts are provided to enable the connection between the HP POD 40c G2 fire alarm system and the customer facility fire system. If the HP POD 40c G2 is connected to the customer facility systems, then the alarms initiated by the HP POD 40c G2 notify the facility systems.

It is your responsibility to facilitate these connections. HP can make these connections when specifically contracted to deliver these services and a Scope of Work has been drafted, reviewed, and signed for delivery services.

The customer must provide an independent connection for each system listed in the following table.

Alarm	Description
Fire prevention alarm	Smoke is detected in the HP POD 40c G2.
Fire suppression system (optional)	The suppression system alarm is activated and gas is dispersed to suppress a fire.
Security	A security breach occurred.
EPO	The EPO system is activated by manually pressing the EPO button or by a thermal event, and the HP POD 40c G2 is shut down.

The electrical layout of the fire alarm system is described in the schematic drawing that is supplied with the *HP Performance Optimized Datacenter 40c G2 Site Drawing Package*.

Environmental considerations

Environmental risks

- Avoid placing the HP POD 40c G2 directly along a drainage path or in an area prone to flooding.
- Verify that the HP POD 40c G2 is properly grounded in accordance with NFPA 70 and local and regional regulations (IEC for EMEA and APJ).

Cold weather

The HP POD 40c G2 requires a site chilled water supply and return, humidifier supply and drain, and condensate drains. Extreme cold weather can cause damage to the supply and drain lines. Evaluate the following for additional cold weather protection:

- Regional location of the HP POD 40c G2
- Exposure of the supply and drain lines to extreme cold temperatures

Extreme cold weather can affect crane and lifting operations. When temperatures drop below -12.2°C (10°F), appropriate consideration must be made with respect to shock loading, crane hydraulics, and possible de-rating of the crane.

Areas prone to lightning or power surges

The HP POD 40c G2 structure and internal components are all bonded together. A common Grounding Electrode Conductor Connection point is provided. Proper bonding and grounding of the HP POD 40c G2 minimizes the effects of a lightning strike. A surge protection device is provided on the HP POD 40c G2 input connection to protect the HP POD 40c G2 electrical system from voltage transients. If your site is in an area that is subject to frequent lightning strikes, the HP POD 40c G2 must be protected in accordance with NFPA 70 (NA) and IEC (EMEA and APJ). HP recommends that you contact a certified lightning protection consultant.

Seismic activity

If your site is in an area that has frequent seismic activity, HP recommends that you contact a seismic activity consultant. If your site is in an area that has high vibration level, HP recommends that you contact a vibration isolation consultant. You must specify the method of anchoring the HP POD 40c G2, if necessary.

Site plan requirements and actions

Completing a site assessment

HP requires a detailed site assessment prior to planning and preparing the customer site location for the HP POD 40c G2. Consult with HP to schedule a site assessment.

A standard site assessment visit includes the following tasks:

- Selecting an appropriate site for the HP POD 40c G2
- Assessing the proposed site for:
 - Measurements for clearances
 - Infrastructure for the final solution
 - Access to utilities
 - Site pad
 - Installation considerations, including locations for delivery trucks, large installation equipment (such as cranes), and storage
 - Electrical infrastructure
 - Chilled water infrastructure
 - Facility network and security systems
- Developing an engagement plan and verifying customer contacts
- Discussing future development and growth plans

For a complete site assessment checklist, see "Appendix A: HP site assessment (on page [27](#))."

HP Site Preparation Drawing Package

After receiving a signed purchase agreement, HP provides detailed engineering drawings. These drawings contain information to assist you and your MEP team to prepare the site for POD installation. If there are areas of special interest, HP can work directly with your MEP team to provide additional assistance.

Zoning and permit requirements

You are responsible for compliance of the overall installation in accordance with all local and national regulations, ordinances, codes, and the product specifications.

Project coordination

Your Project Manager must perform the following tasks:

- Coordinate with all trades prior to installation to ensure that trade conflicts are resolved.
- Coordinate the installation and integration of all systems.

- Ensure that the site safety and security programs are properly administered.
- Interface directly with the HP installation project manager to ensure clear lines of communication during the installation and commissioning processes.

Site planning

A comprehensive site plan assists with the site design (MEP) and ensures the best possible HP POD 40c G2 installation process. When creating a site plan, consider the following information:

- HP POD 40c G2 site requirements detailed in this document
- HP POD 40c G2 site preparation drawing package
- HP POD 40c G2 readiness checklist ("[HP POD 40c G2 site readiness checklist](#)" on page 31)
- HP POD 40c G2 installation (on page 24)

The HP team can assist you by answering questions and help to guiding you throughout the process.

HP POD 40c G2 installation

HP POD 40c G2 installation includes the following:

- Installation equipment staging (on page 24)
- HP POD 40c G2 lifting layout (on page 24)
- HP POD 40c G2 storage requirements (on page 25)
- Additional structures (on page 25)

Installation equipment staging

Staging for the following items must be identified and considered:

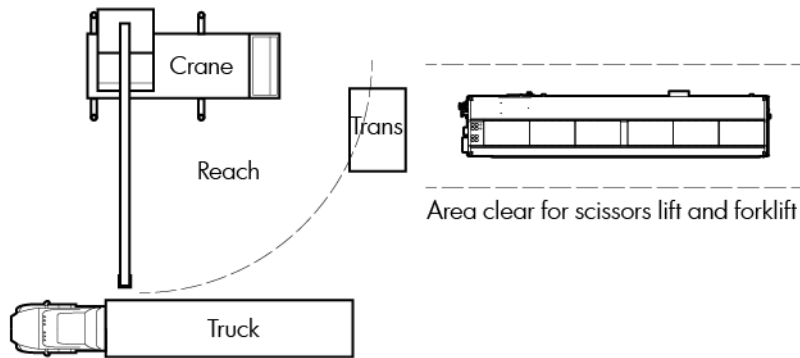
- Truck and component staging
- Installation equipment staging
- Site traffic
- Regulatory or local permits

HP POD 40c G2 lifting layout

When preparing a site plan, identify where to place the HP POD 40c G2 and the equipment used for assembly. The figure below shows the following locations on an HP POD 40c G2 assembly site:

- HP POD 40c G2 location
- Crane location

- Assembly equipment locations



HP POD 40c G2 lifting requirements



WARNING: The only approved method for lifting the HP POD 40c G2 is the use of a spreader bar harness. Lifting an HP POD 40c G2 in any other manner can cause damage to the HP POD 40c G2 and void your warranty.

HP POD 40c G2 storage requirements

If the site is not ready for assembly and operation, determine a location for storage when creating the site plan.



CAUTION: The HP POD 40c G2 must maintain 20% relative humidity to minimize condensation and oxidation within the HP POD 40c G2.



CAUTION: While being stored, the HP POD 40c G2 must be kept in a level position even if stored on a trailer.

Changes in ambient temperatures can cause condensation in a non-operational HP POD 40c G2. If the HP POD 40c G2 is placed in storage or is in non-operating mode for over 72 hours, HP recommends using one of the following methods to minimize condensation and oxidation within the HP POD 40c G2:

- Desiccant unit
- Desiccant material
- Heater with a fan
- Air conditioner with a heater strip

Consult with HP Services to determine the most effective method.

Additional structures

If a customer-provided vestibule or other structure is installed and connected to the HP POD 40c G2, the following specifications must be maintained:

- To protect the HP POD 40c G2 and ensure a waterproof barrier, flashing must be installed to the exterior of the HP POD 40c G2 in the location where the other structure is attached.

- Access landings might be required to maintain the required access to the HP POD 40c G2 electrical panels.

Appendix A: HP site assessment

HP POD 40c G2 site assessment checklist

During a survey of the readiness of a proposed customer site for the HP POD 40c G2, the site is inspected for the following:

- Accessibility of machinery for the transportation and installation of the HP POD 40c G2
- Assessment of the suitability of the site infrastructure for installing the HP POD 40c G2 and for supporting infrastructure preparation and serviceability requirements

HP responsibilities

Item	Description	Sign-off
1. Engagement plan	Develop an engagement plan with specific requirements relating to the proposed installation site.	
2. Site visits	Schedule site visits on mutually acceptable dates, during normal HP business hours.	
3. Test equipment	Document any test equipment used in the customer report.	
4. Installation site review	Review and discuss the proposed installation site with the customer. This initial review includes physical examination of the proposed installation site and, at the sole discretion of HP, can include physical measurements of the area size and clearances.	
5. Indoor/outdoor installation	Identify whether the HP POD 40c G2 installation is indoors or outdoors as this can affect the degree and type of infrastructure required and the mounting needs.	
6. Site pad	Inspect the proposed installation site to assess compliance with the HP POD 40c G2 mounting specifications. Ensure that the customer is fully aware of the following requirements: • Proper support capabilities must exist. If the customer intends to edge or point load on the utility and cargo ends, there must be support in the center to prevent deflection. • Upon installation, the POD structure must be leveled to $\leq 0.5^\circ$, which can be checked at that time with a surveyor's transit. • Shimming is allowed around the perimeter of the POD. • Place shims in increments across the length of the HP POD 40c G2 to ensure that the HP POD 40c G2 is level.	
7. Materials and construction inspection	Visually inspect the materials and construction at the proposed installation site to identify issues that can impact the HP POD 40c G2 installation. Verify that the area is adequate for truck delivery, staging, and crane location.	

Item	Description	Sign-off
8. Clearances	Inspect the proposed installation site to confirm clearance requirements for installation and serviceability as per the HP POD 40c G2 specifications. Necessary clearances are determined, in part, based on the specific installation plans and infrastructure design. Location, orientation, and planned utilization can affect the necessary clearances. Consider future planning for the space around the installation site.	
9. Support infrastructure location	Evaluate the HP POD 40c G2 installation site in relation to the planned support infrastructure location. Conduit lengths and the utility pathway design must be taken into consideration in the planning stages. The proposed support infrastructure design and the location of required utilities are discussed with the customer's site engineering personnel to identify elements that can impact the HP POD 40c G2 installation site decisions.	
10. Support infrastructure for access requirements	Evaluate the proposed installation site for the HP POD 40c G2 and the support infrastructure for access requirements. The evaluation is based on the information provided by the customer at the time of the site visit. In the absence of installation-specific information, general requirements are used as the basis for the evaluation. The delivery path is visually examined and discussed with the customer's site engineering personnel to identify obstacles to installation.	
11. Site engineering interviews	Conduct interviews with the customer's site engineering personnel and site facilities personnel to gather information related to the origin of the power source and network services proposed for use with the HP POD 40c G2. HP must visually inspect the proposed power protection equipment. Means of delivery, connections, and pathways are documented.	
12. Capacity of electrical infrastructure	Based on the review of customer-provided site documentation (such as single-line and as-built drawings), examine equipment panels and monitoring system data, as available. HP must determine whether adequate capacity exists in the current electrical infrastructure to be used or if additional study is required. Determine if the level of redundancy required as stated by the site engineering personnel can be provided by using the existing infrastructure. This takes into consideration the proposed installation site of the HP POD 40c G2, the potential HP POD 40c G2 payload, and the customer stated redundancy requirement. Components can include generators, UPSs, and switch gear.	

Item	Description	Sign-off
13. Chilled water infrastructure	Determine the overall chilled water capacity, available flow rates, and supply/return temperature restrictions. Determine if there are any site specific requirements that mandate additional chilled water equipment, such as heat exchangers or mixing apparatus. Locate any existing or planned supply/return headers.	
14. Security	Conduct interviews with the customer site engineering personnel to determine the level of security required for the HP POD 40c G2 and its infrastructure. The proposed installation site is assessed for suitability in relation to the customer requirements.	
15. Recommendations	Following the HP installation site visit, analyze the data collected and prepare a report of findings. HP must identify potential obstacles to installation and recommendations for any additional testing or changes to the installation plan.	

Customer responsibilities

Item	Description	Sign-off
1. Point of contact information	Provide HP with the name and telephone number of the designated point of contact for the purposes of this service.	
2. Service listing information	Provide all information required under this service listing or reasonably determined by HP to be necessary to deliver the service, including but without limitation, any documentation (internal or external) regarding prior plans or investigations used to identify the proposed installation site.	
3. Timely response	Provide a timely response (such as, in a time period that does not adversely affect the HP scheduled performance of the service) to all requests for information by HP.	
4. Access to subject areas and support areas	Provide HP access to all subject areas and support areas, including the proposed installation site and the mechanical or electrical infrastructure provided to support the HP POD 40c G2.	
5. Badge access	Provide HP badge access or an escort for the duration of the site visit to facilitate required access to all necessary areas.	
6. Site engineering personnel	Customer site engineering personnel familiar with the proposed installation site and personnel responsible for the maintenance and support of the existing infrastructure must be available to answer questions.	
7. Documentation	Provide HP copies of all available mechanical and electrical system design documentation, including as-built drawings and electrical single-line drawings. As appropriate to the specific location, provide HP with campus maps, building drawings, floor plans, and other relevant prints to assist in the documentation and evaluation of the proposed installation site.	
8. Network infrastructure information	Provide HP information regarding the planned network infrastructure connection points and pathways.	

Item	Description	Sign-off
9. Permission for Photographs	Grant HP permission to take photographs for report illustration purposes.	
10. Project logistics	Arrange site-specific project logistics at the time of scheduling. Failure to provide necessary authorizations can limit the effectiveness of the service and can, at the discretion of HP, impact scheduling or result in the postponement of the service.	
11. Business visas	Provide assistance in instances where a temporary business visa is required for HP personnel to visit the site. This assistance typically takes the form of preparing a letter of invitation. In some cases, a formal request must be made by the local company for which the work is taking place.	

Appendix B: Preparing for delivery

Pre-delivery tasks

Allow adequate time for planning, scheduling, obtaining permits, design approval, inspections, and so on.

Installation prerequisites

Before installing the HP POD 40c G2, verify that the following prerequisites are met:

- All components are delivered to the facility.
- The HP POD 40c G2 and power distribution components are in the final location.
- Facility power, water, and drainage are at the final location.
- Provisions for properly grounding the HP POD 40c G2 are made.
- Required clearances exist, including overhead.
- All trade personnel required for assembly are coordinated.

HP POD 40c G2 site readiness checklist

Before installing the HP POD 40c G2, follow all steps listed in this guide, the site plan, and the following checklists.

Architectural/environmental considerations

Item	Description	Sign-off
1	Verify that the site location supplies sufficient locations for support. Ensure that upon installation the POD can be leveled to $\leq 0.5^\circ$. If edge or point loading is used, ensure a center support can be accomplished using shims and so on, to ensure that the POD can be properly leveled. Shimming is allowed around the perimeter in increments. A surveyor's transit should be used upon installation to check the POD leveling requirements.	
2	Verify that the pad can support the total weight of the HP POD 40c G2 solution by verifying that load calculations have been performed by your engineering team.	
3	Verify that the site has provisions for grounding.	
4	Verify the HP POD 40c G2 is not in the direct path of any external heat loads, such as generators.	
5	Determine the average local temperatures and ensure that adequate environmental protection is provided, such as cold weather protection, if required.	
6	Verify that the site altitude is less than 3,048 m (10,000 ft).	

Item	Description	Sign-off
7	When installing on an elevated surface, verify that the maximum height requirements for the circuit breaker actuator meet the local and national requirements. Verify that proper landings and the catwalk are planned for electrical cabinet access.	
8	Verify the planning for required egress routes for all HP POD 40c G2 personnel doors, cargo doors, and service area doors, including landings, the catwalk, and stairs.	
9	Verify that the local AHJ is contacted, all applicable codes and site-specific location guidelines are reviewed, and all required permits are obtained.	
10	Verify that the site location has clearances for the HP POD 40c G2 installation, including any permanent structures, such as fences, walls, vestibules, and buildings.	
11	Verify that all utilities, overhead and underground, are identified to maintain required clearance.	
12	Verify that there is adequate clearance around the HP POD 40c G2 for door operation, installation, and maintenance equipment.	
13	Verify that the site location and site pads are marked for any transformer, external switchboard, generators, and powerhouses.	
14	Verify that the site has provisions for proper grounding and that the site location includes a grounding electrode system.	
15	Verify that the site location has adequate lighting for the HP POD 40c G2 installation.	
16	Verify that a truck and equipment staging areas are identified.	
17	Verify the location for the fuel tanks for generators, powerhouses, and other equipment, if applicable.	
18	Verify the locations for cranes off-loading and operation during HP POD 40c G2 installation.	
19	Verify site access and clearances for equipment, including the crane and forklifts. A clear path to the site must be maintained with clearance for all gates, headers, utility lines, and so on.	
20	Verify that the locations for storage and trash disposal are identified.	
21	Verify that the safety equipment is planned for and in place in accordance with the customer's site safety program.	
22	Verify the site interfaces and locations to connect the fire alarm, security system, and communication system to the HP POD 40c G2. This ensures that the POD can be properly connected to the site BMS.	
23	Verify that proper disposal methods are used for existing or potentially contaminated and/or hazardous materials.	
24	Verify the availability of security systems or equipment, including site fences, required after construction.	
25	Verify the availability of temporary facilities associated with the relocation of existing services and operations.	
26	Verify that all work relating to soil testing, removal, and that site remediation is complete.	
27	Verify that a temporary or permanent load bank is available, if applicable.	

Item	Description	Sign-off
28	Verify the location of the EPO system external to the powerhouses, if applicable.	
29	Verify the location of the remote electronic monitoring system.	
30	Verify that tie-downs and other AHJ-required facilities for the HP POD 40c G2 and power containers are complete at least one week prior to arrival of HP-provided equipment.	

General water supply

Item	Description	Sign-off
1	Verify that the site drainage is complete, and the HP POD 40c G2 is not in a drainage path or flood prone area. HP recommends placing the HP POD 40c G2 on a raised site pad to prevent water from entering the HP POD 40c G2.	
2	Verify that the humidification water quality meets or exceeds these standards, which are essentially drinking water standards.	
3	Verify the humidification water supply isolation valve is installed for each POD.	

Chilled water system

Item	Description	Sign-off
1	Verify the chilled water supply and return headers are accessible, in the appropriate location, and 100 cm (4 in) in diameter.	
2	Verify that the chilled water supply temperature meets the minimum POD chilled water supply temperature of 10°C (50°F).	
3	Verify that a sufficient chilled water flow rate is available.	
4	If necessary, verify that the customer-required chilled water return temperatures can be attained.	

Power requirements

Item	Description	Sign-off
1	Verify that the short circuit analysis, arc flash, and circuit breaker coordination studies are complete. Verify power work is completed according to the approved conduit routing drawings that show the exact routes, plan view, sections, and elevations.	
2	Verify that temporary site power for installation and construction is planned and available, if applicable.	
3	Verify that adequate site power exists per the HP POD 40c G2 requirements.	

General

Item	Description	Sign-off
1	Verify the utility connection to the HP POD 40c G2 and any required metering equipment.	
2	Verify the third-party commissioning services that might be required by the owner.	

Item	Description	Sign-off
3	Verify that the HP Project Team coordinates with other site construction activities.	

Appendix C: Regulatory compliance notices

HP POD 40c G2 regulatory compliance

The HP POD 40c G2 complies with the following regulatory standards.

Standard	Certification level	Standard title
UL 60950	ETL "Listed"	• UL 60950—<i>Standard for Safety Information Technology Equipment, Part 1: General Requirements</i>, Issue: 2007/03/27, Edition: 2 • UL 60950—<i>Standard for Safety Information Technology Equipment, Part 22: Equipment to be Installed Outdoors</i>, Issue: 2007/04/23, Edition: 1
NFPA 70	ETL "Classified"	NFPA 70— <i>National Electric Code, 2008 Edition</i> , © 2008 National Fire Protection Association
NFPA 72	Designed to Comply With	<i>National Fire Alarm code, 2007 Edition</i> , © 2006 National Fire Protection Association
NFPA 2001	Designed to Comply With	<i>NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems, 2008 Edition</i> , © 2008 National Fire Protection Association
IBC 2009	Designed to Comply With	<i>2009 International Building Code</i> , © 2010 International Code Council, Inc.

Regulatory compliance identification numbers

For the purpose of regulatory compliance certifications and identification, this product has been assigned a unique regulatory model number. The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

Federal Communications Commission notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian notice (Avis Canadien)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Glossary

AHJ

authority having jurisdiction

APJ

Asia Pacific Japan

BMS

building management system

door

A hinged portion of an enclosure that covers an opening.

DX

direct expansion

ECS

environmental control system

EMEA

Europe, Middle East, and Africa

EPO

emergency power off

equipment

A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, a modular data center. (Source: NEC.)

IEC

International Electrotechnical Commission

ISO

International Organization for Standardization

labeled

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

listed

Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards potential of not more than 42.4 V (DC or peak) supplied by a primary battery or by an isolated secondary circuit, and where the current capacity is limited by an overcurrent device, such as a fuse, or by the inherent capacity of the secondary transformer or power supply, or a combination of a secondary winding and an impedance. A circuit derived from a line-voltage circuit by connecting a resistance in series with the supply circuit to limit the voltage and current is not identified as a low-voltage limited energy circuit. or has been tested and found suitable for a specified purpose.

The means for identifying listed equipment might vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. Use of the system employed by the listing organization allows the authority having jurisdiction to identify a listed product.

NA

North American

overcurrent protection

A device designed to open a circuit when the current through it exceeds a predetermined value. The ampere rating of the device is selected for a circuit to terminate a condition where the current exceeds the rating of conductors and equipment due to overloads, short circuits and faults to ground.

structure

Enclosure of sufficient size to enable entry of personnel.

UL

Underwriters Laboratory

UPS

uninterruptible power system

VESDA

very early smoke detection apparatus

Documentation feedback

HP is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (<mailto:docsfeedback@hp.com>). Include the document title and part number, version number, or the URL when submitting your feedback.

Index

A

about this guide 5
areas prone to lightning or power surges 22
assembly 31
assembly area 24

C

cables, FCC compliance 36
Canadian notices 36
capacity limitations 7
central facility infrastructure connections 17
clearance area 8, 10
cold weather considerations 22
connection portals 17
connections, additional 17
connections, facility 17

D

delivery considerations 31
dimensions 8

E

electrical power capacity 7
electrical system 15
environmental considerations 22
environmental control system (ECS) 17
environmental risks 22
equipment, installation 24
expansion 11

F

facility connections 17
FCC (Federal Communications Commission)
notice 35
Federal Communications Commission (FCC)
notice 35
fire and safety 20
fire suppression 6
future expansions 11

G

grounding requirements 11

H

HP site preparation drawing package 23
humidifier 20

I

installation 24
installation equipment 24
IT cable portals 17

L

lifting layout and requirements 24
lightning protection 22

M

materials, piping 15
mechanical cooling capacity 7
modifications, FCC notice 35

N

network connections 17

O

other objects 25
overview 5

P

permit requirements 23
piping materials 15
portals, connection 17
power infrastructure installation 15
power surges 22
pre-delivery 31
preparing for assembly 31
project coordination 23
proximity to utilities and drains 12

R

regulatory compliance identification numbers 35
regulatory compliance, HP POD 40c G2 35

S

safety information 6, 10
security 6, 20
seismic activity 22
site assessment 6, 23, 27
site assessment checklist 27
site pad 8
site planning considerations 24
site preparation 6
site preparation checklist 31
site requirements 8
storage locations 25
supported facility connections 17
system capacity 7

T

transformer and switchboard 16

U

utilities 12

V

vestibule specifications 25

W

water supply 12, 13
weight 8

Z

zoning and permit requirements 23